

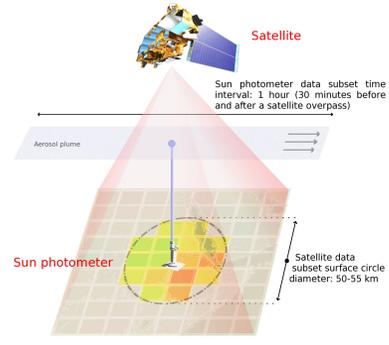
Cross-characterization of aerosol properties from multiple spaceborne sensors facilitated by regional ground-based observations

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Abstract

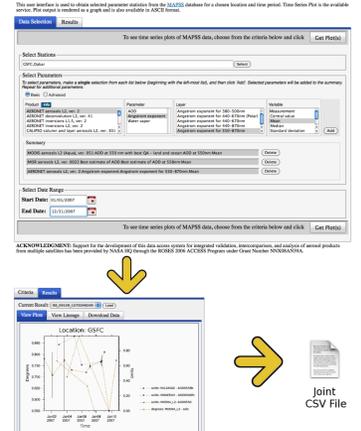
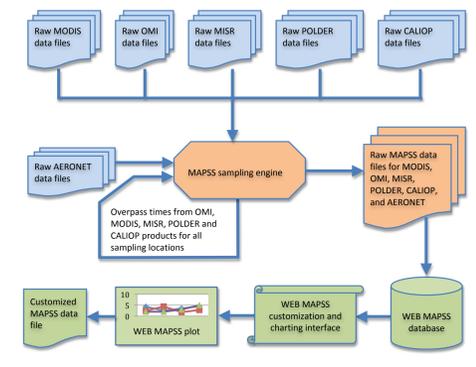
Aerosol observations from space have become a standard source for retrieval of aerosol properties on both regional and global scales. Indeed, the large number of currently operational spaceborne sensors provides for unprecedented access to the most complete set of complimentary aerosol measurements ever to be available. Nonetheless, this resource remains underutilized, largely due to the discrepancies and differences existing between the sensors and their aerosol products. To characterize the inconsistencies and bridge the gap that exists between the sensors, we have designed and implemented an online Multi-sensor Aerosol Products Sampling System (MAPSS) that facilitates the joint sampling of aerosol data from multiple sensors. MAPSS consistently samples aerosol products from multiple spaceborne sensors using a unified spatial and temporal resolution, where each dataset is sampled over Aerosol Robotic Network (AERONET) locations together with coincident AERONET data samples. In this way, MAPSS enables a direct cross-characterization and data integration between aerosol products from multiple sensors. Moreover, the well-characterized co-located ground-based AERONET data provides the basis for the integrated validation of these products.

MAPSS framework



- Sample data from multiple sensors over uniform areas of 55km centered around AERONET sun photometer ground stations
- Sample AERONET data within ±30 minutes of each overpass of the satellites
- Report a range of statistics characterizing the samples, including mean, mode, standard deviation, and key parameters of a plane or a line fitted to the sample

Integrated on-line system

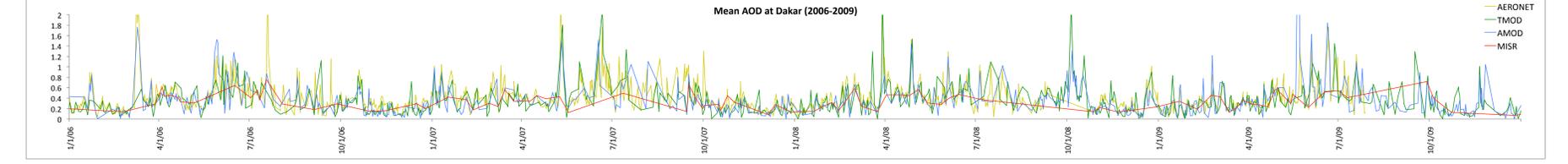
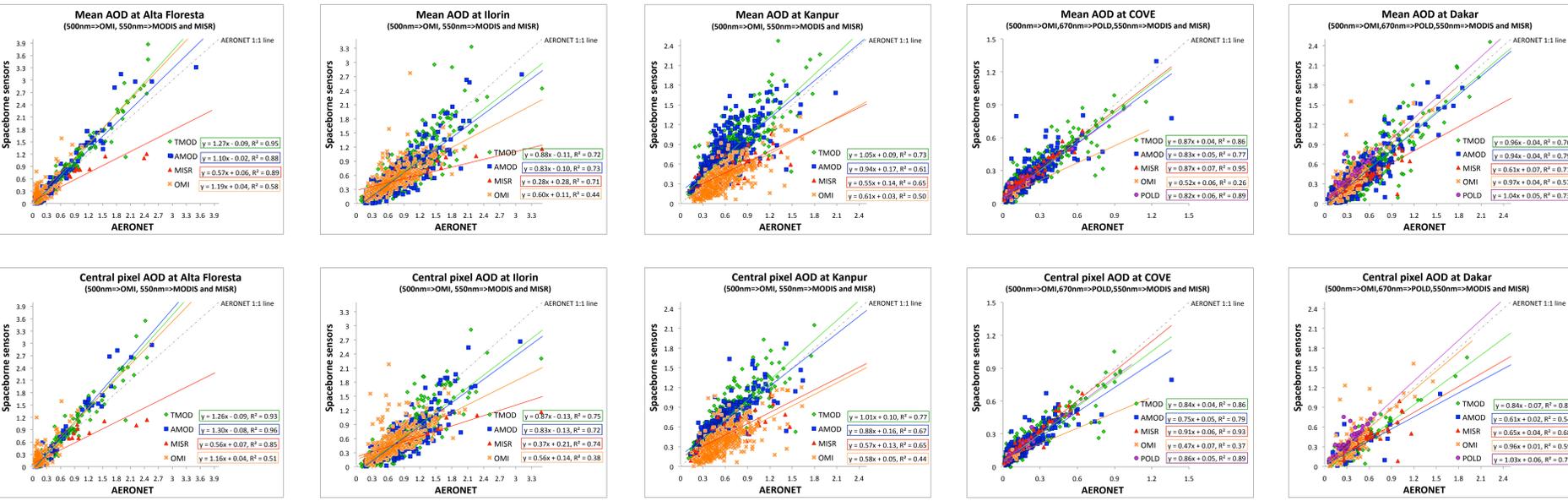


- Using the MAPSS framework, the supported data products are sampled daily and archived online at <http://modis-atmos.gsfc.nasa.gov/MAPSS/> in a simple unified comma-separated format (CSV), eliminating the need to learn the individual file format of each aerosol product and to write custom file handling software
- Giovanni-based WEB interface (WEB MAPSS) has been developed to provide a convenient customized access to the data, with on-line plotting and data export capabilities

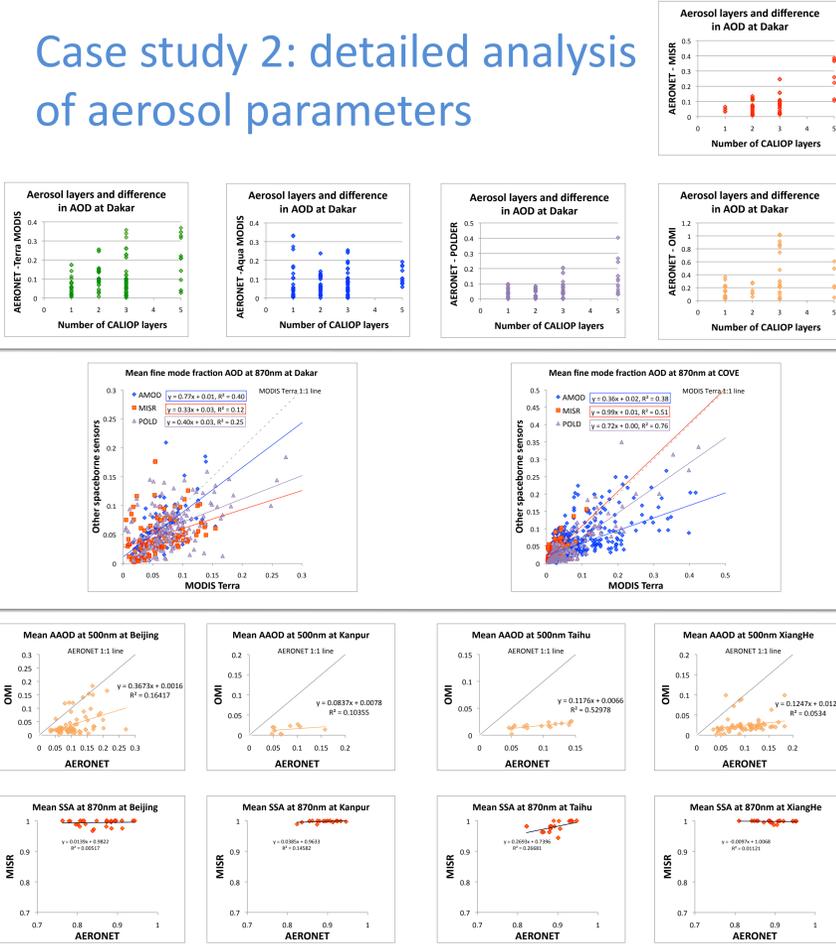
Supported products

AERONET	MODIS Terra and MODIS Aqua	MISR	OMI	CALIOP	POLDER
Products: AOT, SDA, INV Sites: 660 (currently) Data periods: Varies with sites	Products: MOD04, MYD04, MOD05, MYD05 Satellites: Terra (MOD) and Aqua (MYD) Resolution: 1x1 km, 5x5 km, 10x10 km Data period: Jan 2000- (MYD) and Jul 2002-(MOD) Equator crossing: 10:30AM (MOD) and 1:30PM (MYD)	Products: MIL2ASAE Satellites: Terra Resolution: 17.6x17.6 km Data period: Jan 2000- Equator crossing: 10:30AM	Products: OMAERUV Satellites: Aura Resolution: 13.7x23.7 km Data period: Oct 2004- Equator crossing: 1:38PM	Products: 05kmALay Satellites: CALIPSO Resolution: 5x5 km Data period: Jun 2006- Equator crossing: 1:32PM	Products: P[1-3]L2TLGC, P[1-3]L2TOGC Satellites: ADEOS (1), ADEOS-2 (2), Parosol (3) Resolution: 19x19 km Data period: Oct 1996-Jun 1997 (1), Apr 2003-Oct 2003 (2), Mar 2005- (3) Equator crossing: 1:30PM

Case study 1: AOD correlation between AERONET and spaceborne sensors



Case study 2: detailed analysis of aerosol parameters



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